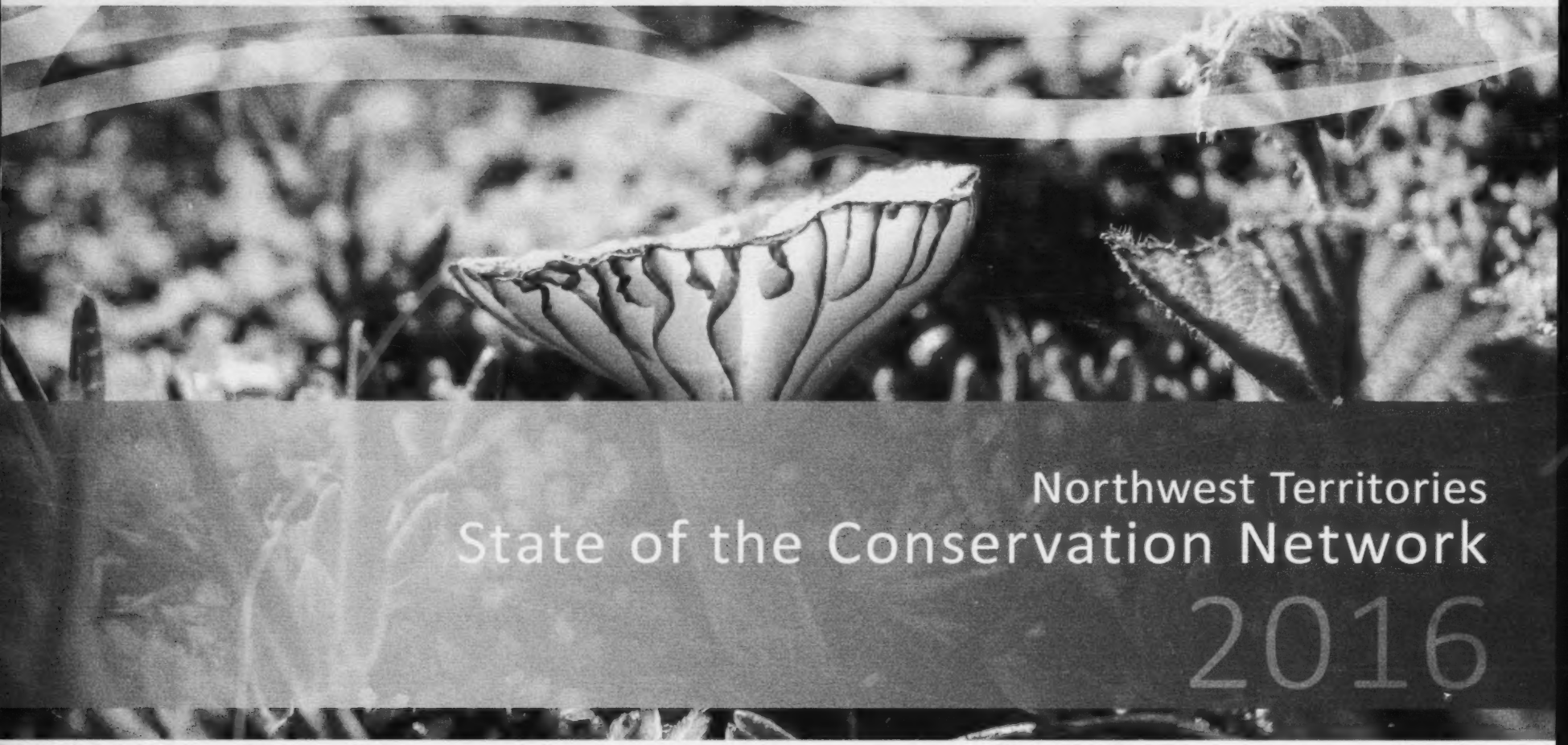

Northwest Territories
State of the Conservation Network
2016

Government of
Northwest Territories

Table of Contents

Introduction 1

Conservation Network Planning Context in the NWT 3

Protected Areas in the NWT 3

NWT Terrestrial Ecoregions for Conservation Network Planning. 6

Conservation Network Planning 7

Climate Change and Conservation Network Planning 9

Wildland Fire Regime and Conservation Network Planning 10

Indicators of the Health of Protected Areas in the NWT 11

1. Degree of Ecological Representation 12

2. Watersheds and Wetlands Representation 15

3. Marine Representation 17

4. Inclusion of Special Features 18

5. Protection of Species at Risk 19

6. Cultural Heritage Representation 22

7. Connectivity 24

8. Consultation and Engagement 25

9. Management Planning 27

Benefits and Opportunities of the Conservation Network in the NWT 28

A Conservation Economy, part of a Diversified Economy 29

Ecosystem Services 31

Human Health 32

Food Security – Indigenous People's Traditional Food Systems 32

Public Education and Outreach 33

Next Steps 34

Find More Information 36

Specific Sources and Notes 37

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Introduction

Fly Beyin Springs Photo: Richard Popko

Beach Ridges on the Taiga Plains

Ecosystems in the Northwest Territories (NWT) are diverse and especially sensitive. Our land, rich in biodiversity, contributes to the high quality of life residents enjoy in the NWT. Our food security and traditional economy rely on continued biodiversity in the north.

The relatively intact state of our biodiversity provides an opportunity unavailable in most other regions of Canada and the world: the ability to proactively plan a healthy future for the land, water, wildlife and people.

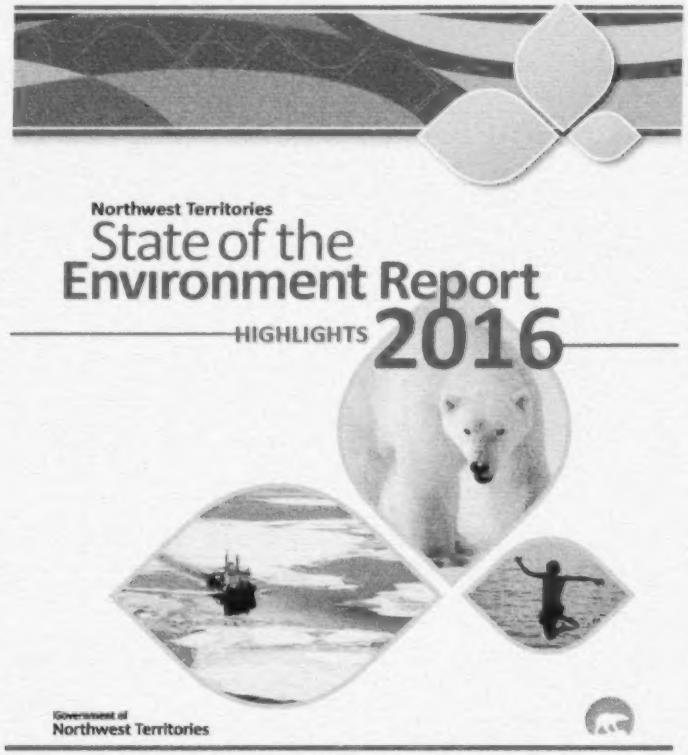
The NWT contributes to regional, national and global efforts to conserve biodiversity by establishing and managing a conservation network.

A **conservation network** includes protected areas and conservation areas at various scales that collectively contribute more effectively to maintaining the integrity of ecosystems and biodiversity, and contributing to ecological, economic and social stability than individual sites could alone. **Protected areas** are the backbone or core of a conservation network as they are ecologically intact and have the highest level of protection, including prohibiting industrial development. Protected areas are permanent, resilient, and are effectively managed and monitored. **Conservation areas** protect various natural and cultural values, and contribute to the conservation network by providing complementary, but less restrictive, protection than protected areas. **Conservation network planning** includes the establishment and management of areas within a conservation network, but also involves the consideration of ecosystem processes and connectivity within the network as a whole.

There are national and global biodiversity targets for protected areas. The 2020 Biodiversity Goals and Targets for Canada are based on global targets set by the international Convention on Biological Diversity. These include the target of at least 17 percent terrestrial and 10 percent marine protected areas by 2020. The target also speaks to the need for protected areas to: include areas of particular importance for biodiversity and ecosystem services; be effectively and equitably managed; be ecologically representative and well-connected; and be integrated into the wider landscape and seascapes.

The NWT State of the Conservation Network Report (Report) includes comprehensive data and information from best available sources, which is used to report on indicators and provide a baseline of comparison for future progress. This first Report focuses solely on protected areas as criteria exist for protected areas and they are well defined in the NWT. As the NWT progresses with defining specific criteria for areas to be part of the conservation network, future reports will report on the conservation network as a whole.

The Report has three sections. The first section covers the planning context in the NWT. The second section describes indicators used to assess the health of protected areas, which contributes to the stewardship section of the NWT State of the Environment Reporting (enr.gov.nt.ca).
The third section outlines the benefits and opportunities gained from a conservation network.
The Report concludes with next steps in reporting and where to find more information.



Conservation Network Planning Context in the NWT

Cirque of Unclimables in Nahanni National Park Reserve Photo: Jackie Zinger

Water and Sediment Sampling on Lac Le Maire Photo: Susan Beaumont, Wek'eezhii Renewable Resources Board

This section: describes the context in which conservation network planning takes place in the NWT; how associated principles are adjusted for unique NWT circumstances; and a description of the 45 ecoregions used in conservation network planning in the NWT. Overarching environmental processes influencing and impacting most northern ecosystems, which are considered during conservation network planning, are also described.

Protected Areas in the NWT

Protected areas have the highest level of protection and are ecologically intact. They are able to maintain a natural state in perpetuity and are large enough to incorporate successional stages of broad habitats and accommodate natural disturbances. Protected areas are effectively managed and monitored to maintain biodiversity within their boundaries. They represent the ecological diversity of a region and are recognized as the most efficient, effective and proactive means to protect biodiversity. There are 14 protected areas on the mainland of the NWT. There are three marine protected areas in the ocean and four terrestrial protected areas with a marine component.

Map 1: NWT Established Terrestrial Protected Areas

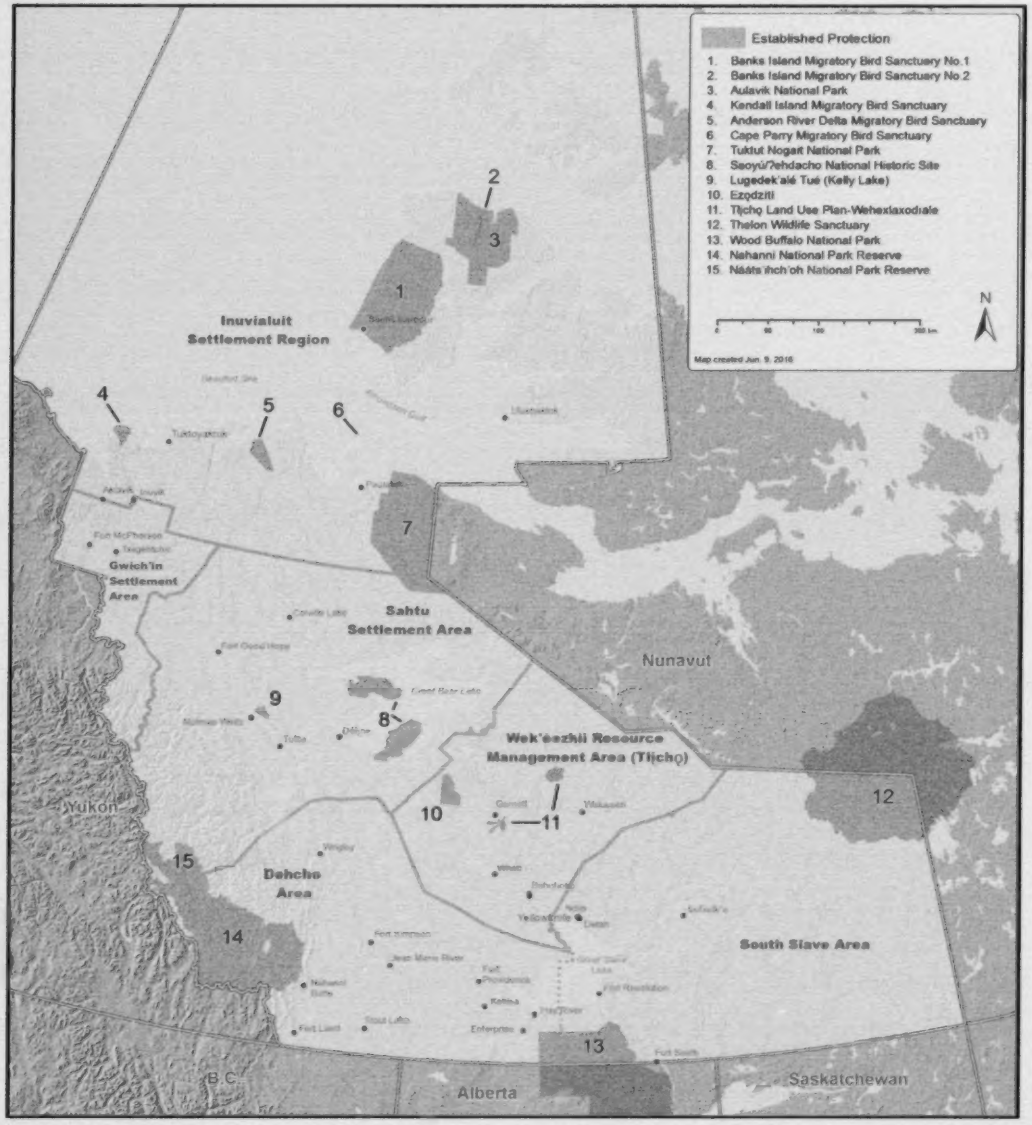


Table 1: Established Terrestrial Protected Areas in the NWT

Terrestrial Protected Areas		
Name of Area	**Size (km²)**	**How it is Protected**
Anderson River Delta Migratory Bird Sanctuary	1,025	*Migratory Birds Convention Act*
Aulavik National Park	12,190	*Canada National Parks Act*
Banks Island Migratory Bird Sanctuary No. 1	19,375	*Migratory Birds Convention Act*
Cape Parry Migratory Bird Sanctuary	1	*Migratory Birds Convention Act*
Ezǫdzìtì	1,375	*Tłı̨chǫ Final Agreement*
Kendall Island Migratory Bird Sanctuary	480	*Migratory Birds Convention Act*
Luge dek'ale' Tue (Kelly Lake)	275	*Sahtù Final Agreement*
Nááts'ihch'oh National Park Reserve	4,860	*Canada National Parks Act*
Nahanni National Park Reserve	30,065	*Canada National Parks Act*
Saoyú-ʔehdacho National Historic Site	5,575	*Canada National Parks Act*
Thelon Game Sanctuary (NWT portion)	21,420	*Territorial Wildlife Act*
Tuktut Nogait National Park	18,840	*Canada National Parks Act*
Wood Buffalo National Park (NWT portion)	9,340	*Canada National Parks Act*
Wehexlaxodıale (Land Use Exclusion Zone)	980	*Tłı̨chǫ Land Use Plan*
Total	**125,801**	**or 9.2% of the NWT**

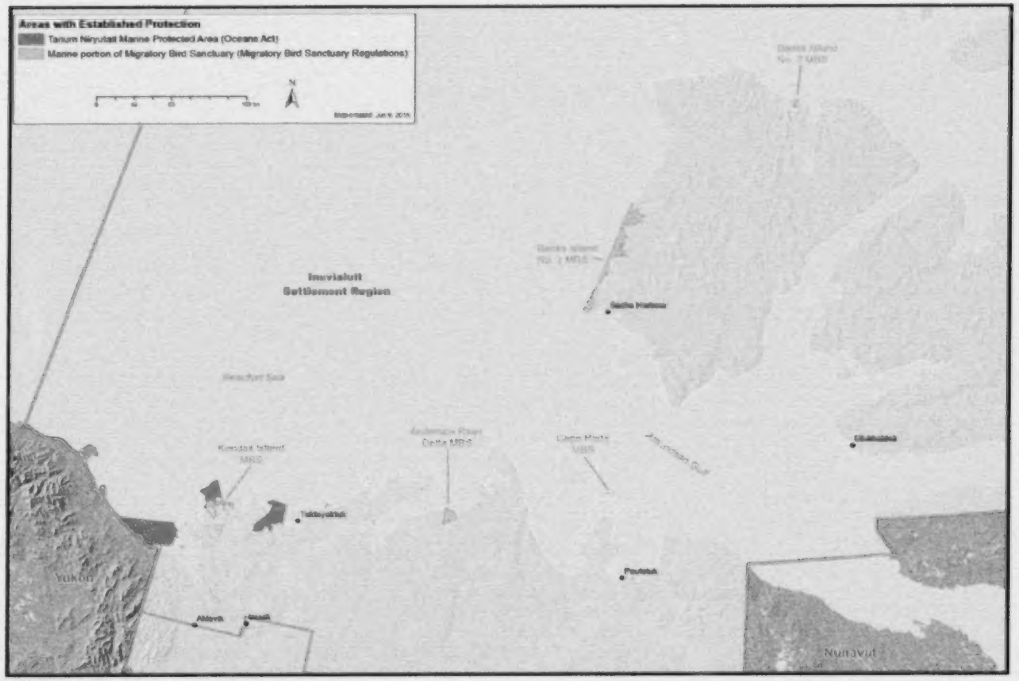
Note: Sizes exclude the marine part of Migratory Bird Sanctuaries. The marine portion is accounted for in Table 2. The terrestrial component of Banks Island Migratory Bird Sanctuary No. 2 overlaps completely with Aulavik National Park.

Table 2: Established Marine Protected Areas and Marine Portion of Terrestrial Protected Areas in the NWT.

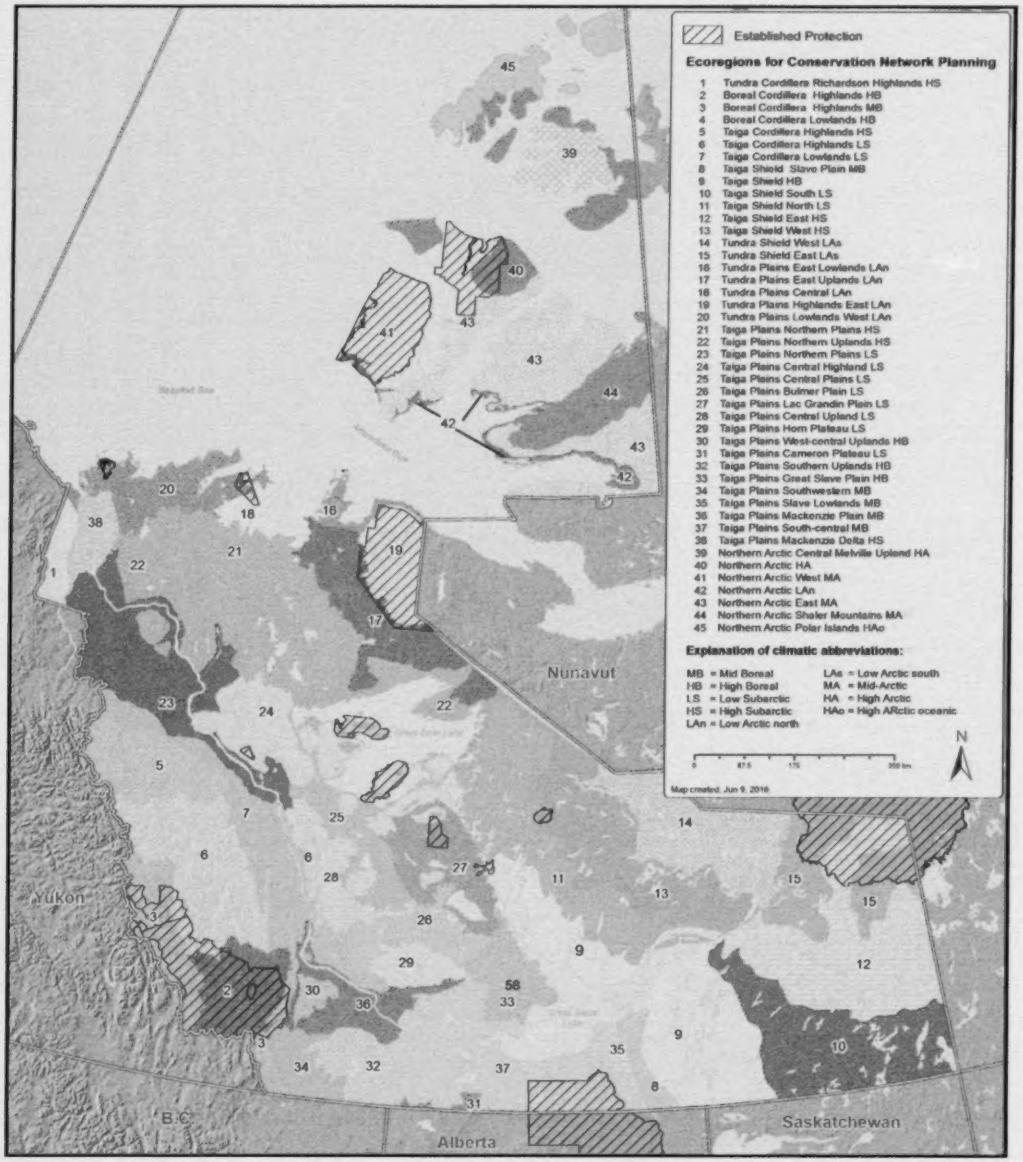
Marine Protected Areas		
Name of Area	**Area (km^2)**	**How it is Protected**
Tarium Niryutait Marine Protected Area	1,800	*Oceans Act*
Kendall Island Migratory Bird Sanctuary	200	*Migratory Birds Convention Act*
Anderson River Delta Migratory Bird Sanctuary	170	*Migratory Birds Convention Act*
Banks Island No. 1 Migratory Bird Sanctuary	800	*Migratory Birds Convention Act*
Banks Island No. 2 Migratory Bird Sanctuary	30	*Migratory Birds Convention Act*
Cape Parry Migratory Bird Sanctuary (marine portion)	1	*Migratory Birds Convention Act*
Total	**3,001**	

Glacial Refugia with Sedge Tundra

Map 2: NWT Established Marine Protected Areas



Map 3: NWT Ecoregions for Conservation Network Planning



NWT Terrestrial Ecoregions for Conservation Network Planning

Northern ecosystems are diverse. They include forests, tundra, wetlands, bogs, lakes, rivers and oceans. These ecosystems can be grouped and described as smaller ecological regions (ecoregions) by using several physical characteristics at a variety of scales.

Terrestrial ecoregions are large natural regions characterized by distinctive regional climate, physical features, types of vegetation and soil types. These ecoregions are used to help describe terrestrial protected areas and to help set future goals for new protected areas.

In 1996, a National Ecological Framework for Canada was developed by the Ecological Stratification Working Group to provide standardized, multi-scale, non-jurisdictional reporting and monitoring units. This national framework was based on the best available information at the time, but some information in the NWT was limited. Since then, the Department of Environment and Natural Resources (ENR) has developed a revised Ecosystem Classification. This new classification fits within an ecoregion framework for continental North America and includes four levels. Under the new classification, there are 150 level IV ecoregions in the NWT. This large number of ecoregions is not considered appropriate for conservation network planning and ecological representation analyses, so they were grouped into 45 larger units more similar to the previous classification.

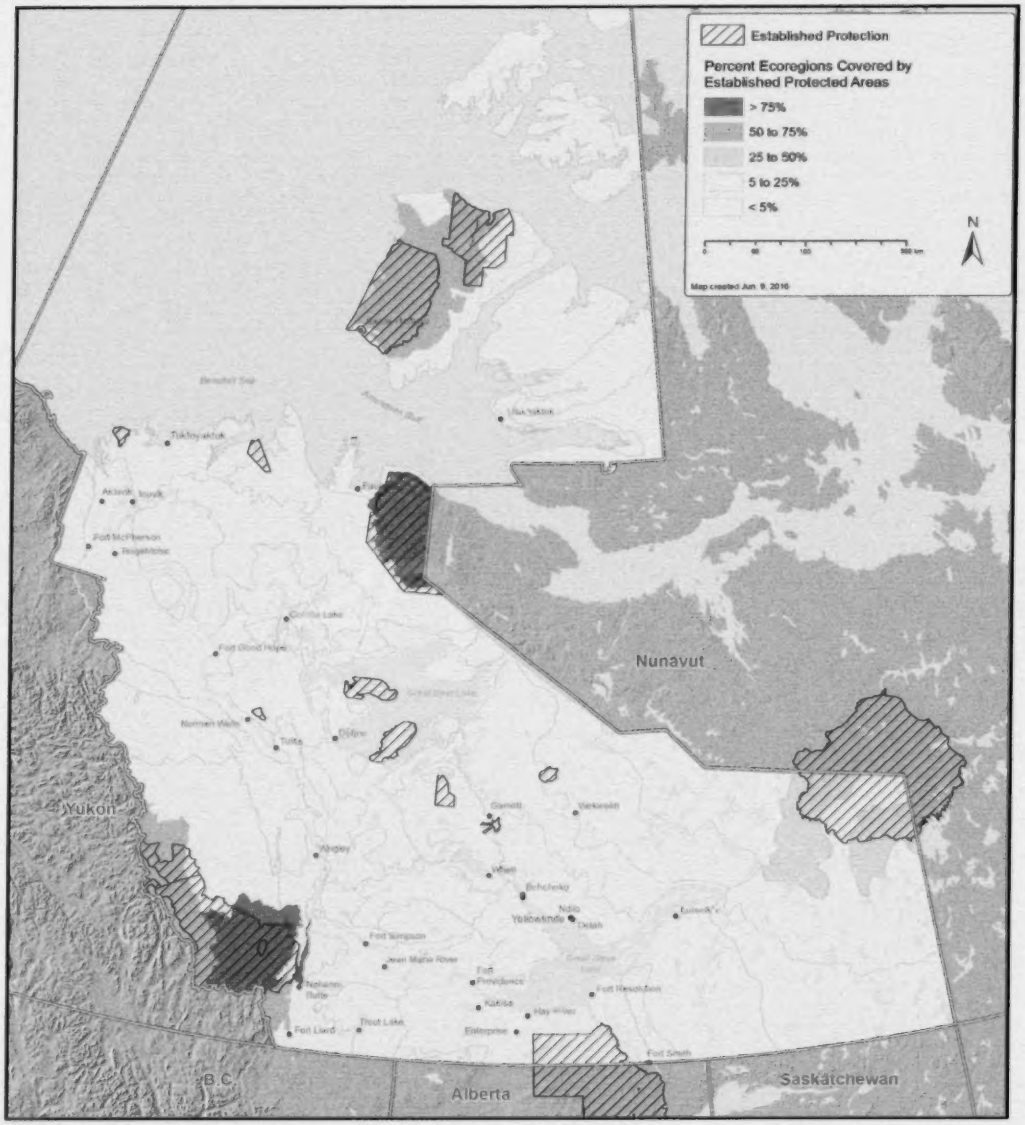
In the evaluation of protected area, the percentage of the land base of an ecoregion covered by protected areas is often reported. However, this is not the best indicator of how effective the protected areas are in protecting biodiversity. Assessing the degree of ecological representation (how well samples of all broad habitats are captured within protected areas) is the better indicator of how effective protected areas are in protecting biodiversity and is consistent with national and international protected areas targets. Both indicators are included in this Report (see indicator 1 for degree of ecological representation) to demonstrate the difference between the indicators and to allow for national comparison.

Conservation Network Planning

Conservation network planning is the process used to analyse the conservation network and provide information on how new areas could be established to better protect biodiversity and sustain the land for future generations. A systematic approach is necessary to do this. Systematic conservation network planning has four components.

Ecological representation, the first component, looks at protecting samples of all broad habitats, both the unique and the more common ones, in protected areas. This follows the theory that rather than looking at individual species, as biodiversity is very complex and there are many parts that are still not understood or even known about, we instead look at elements which determine the distribution of plants and animals. This includes elements making up their habitat, such as vegetation, soils, terrain, climate and lake characteristics. These elements are also referred to as habitat or landscape features. Scientists predict protecting samples of all broad landscape features in an ecoregion within protected areas will help protect the majority of species without having to consider each species individually. This component of conservation network planning is particularly important for the NWT because these enduring landscape features are less subject to change from climate change impacts.

Map 4: Percentage of Conservation Network Planning Ecoregions Covered by Established Protected Areas



The second and third components of systematic conservation network planning look at data at a finer level and include unique or special features and key habitat requirements for focal species. Both may have been missed when looking at ecoregions on a broad scale. Examples of special features in the NWT for which data has been collected include: amphibians and reptiles; rare and may-be at risk plants and lichens; hot and warm springs; karst features; mineral licks; eskers; glacial refugia; beaches and beach ridges; deltas, waterfalls; and rapids.

Focal species can be chosen for their: importance in maintaining ecosystem functions; sensitivity to ecological change; traditional and cultural importance; links with the habitat needs of other species; and/or public appeal. There is limited information available on focal species and their habitat requirements in the NWT. Comprehensive habitat maps for species, other than migratory birds, currently do not exist. Important Wildlife Areas in the western Northwest Territories have been mapped for species classified under the ***NWT Wildlife Act*** as either species at risk or species of socioeconomic importance. While these are key habitats, all of the NWT provides habitat for wildlife.

Ideally, all three components described above would be included in analysing protected areas and the conservation network as a whole. The finer level data that covers the whole NWT is mostly lacking and systematic conservation network planning is limited to focusing mainly on ecological representation analysis and adding finer-level data individually, where it is available.

Mineral Lick in the Taiga Plains Lowland

The fourth component of systematic conservation network planning is connectivity and ecosystem processes. Connectivity must be maintained between protected areas and the conservation network as a whole, so species can move between them and not become isolated. In addition, large ecosystem processes such as fire and water flow must continue for the land to be healthy. Unlike in other jurisdictions, where conservation network planning is concerned with restoring connectivity by creating buffers and repairing damaged ecosystems, in the NWT it is most important and feasible to maintain our intact ecosystem processes. To achieve this outcome, the land outside of the conservation network is managed in a manner that supports ecosystem processes and allows for movement of our wide-ranging northern species. As a result, the conservation network does not need to be physically connected to achieve connectivity, but instead, fits within a broader land management framework (e.g. multi-region regulatory processes and land use planning).

Each conservation network component contributes to ecosystem integrity as a whole. Their success is measured by indicators drawn from both traditional knowledge and scientific data. Often the best, and sometimes the only local knowledge available in the NWT, is traditional knowledge, which is vital to understanding ecological representation, focal species and special features as well as the connectivity tying them together.

Climate Change and Conservation Network Planning

The effects of climate change are more prevalent in the north, where the average temperature rise is three times higher than other jurisdictions. NWT ecosystems contain species that have adapted to the cold climate and, in many cases, depend on the cold to maintain the conditions needed to thrive. These ecosystems are threatened by climate change impacts in numerous ways. These include:

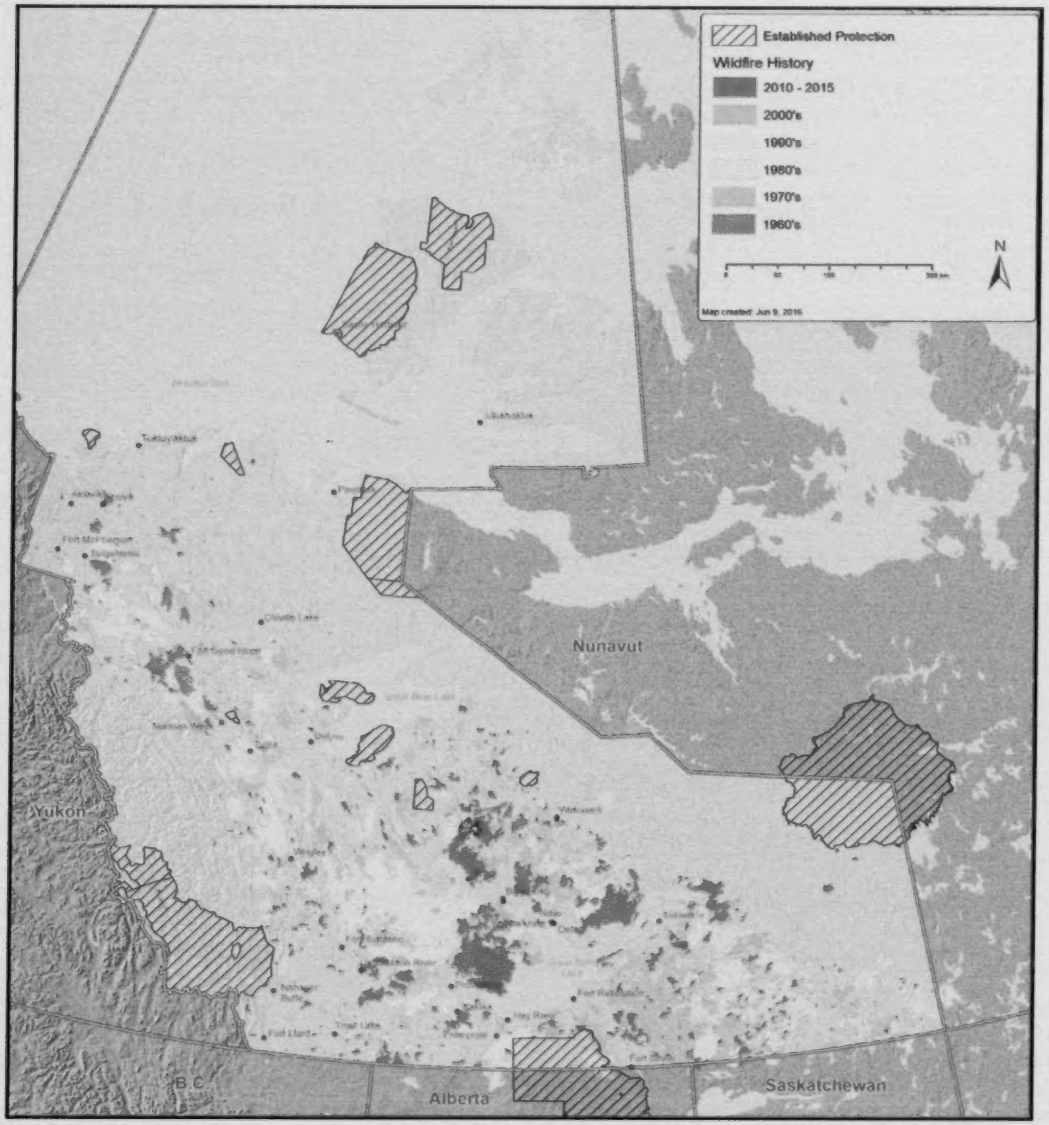
- changes to wildland fire regime;
- storm surges;
- permafrost melt;
- new diseases and parasites;
- mismatch in the timing of food availability;
- extreme weather events, such as ice storms and droughts;
- displacement of species northward or to higher elevations; and
- arrival of exotic and/or invasive species.

The frequency of extreme warm summer temperatures (exceeding 30°C) is expected to increase across the NWT. Heat waves are projected to become more frequent and intense, and the possible impacts could be numerous.

Sea levels will continue to rise during the current century. As the sea level rises, the risk of storm-surge flooding and shoreline erosion increases. Such events will likely occur more frequently, particularly in areas, such as Tuktoyaktuk, that are already being impacted by these events.

The latest research on climate change adaptation speaks to the importance of conservation network planning and protected areas, in particular in the face of a changing climate. Protected areas include healthy populations of species and ecosystems that are more resilient to change. Ecological representation is important because the enduring features used in the analysis are less subject to change. In addition, protected areas containing intact ecosystems act as natural carbon storage and are considered a 'natural solution' to buffer the worst impacts of climate change.

Map 5: NWT Wildland Fire History 1965 to 2015



Wildland Fire Regime and Conservation Network Planning

Wildland fire is a vital ecological component in the northern boreal forest. It is a major change agent and is crucial to forest renewal by releasing valuable nutrients stored in the forest floor. Fire opens the forest canopy to sunlight, which stimulates new growth. The biodiversity of the northern circumpolar boreal forest is largely a fire-induced diversity.

Fire creates a patchwork across the landscape of plant communities at various stages and composed of different species. Many species require a combination of different ages and types of habitats to complete their life cycles. The ongoing challenge for wildland fire management agencies is to protect human values while still allowing fire to continue its important ecological role in maintaining healthy forests.

Ideally, protected areas should include both young and old forests and a range of types of habitats, such as wetlands, forests and open fields, to be strong and resilient. Fire is one factor when considering the size and management planning needed for individual protected areas. Ideally, a protected area should be large enough to recolonize itself naturally following a large fire. Increasing wildland fire activity in the boreal and taiga forest due to climate change could cause challenges for protected areas managers in the future.

Indicators of the Health of Protected Areas in the NWT

The health of protected areas in the NWT is currently measured using the following indicators:

- Degree of ecological representation
- Watershed and wetland representation
- Marine representation
- Inclusion of special features
- Protection of species at risk
- Cultural heritage representation
- Connectivity
- Collaboration and engagement
- Management planning

1. Degree of Ecological Representation

The first indicator used to assess the health of protected areas in the NWT is the degree of ecological representation within ecoregions. The map shows to what extent landscape features within an ecoregion are represented within protected areas.

A moderate degree of ecological representation means between 30 and 60 percent of the representation goals for the landscape features in an ecoregion are achieved by protected areas.

A high degree of ecological representation means 60 to 80 percent of the representation goals for landscape features in an ecoregion are achieved by protected areas. A very high degree of representation corresponds to 80 to 90 percent.

Fully met means more than 90 percent of the representation goals for landscape features in an ecoregion are met.

Ts'ude niline Tu'eyeta Candidate Area

Eleven of the NWT's 45 ecoregions have at least a moderate degree of ecological representation. Current protected areas in the NWT contribute to ecological representation in the ecoregions where they are located. The ecoregions, where ecological representation has been fully met or a very high degree of ecological representation has been met, are covered by three national parks: Nahanni, Tuktut Nogait and Aulavik; and one large Migratory Bird Sanctuary: Banks Island No. 1. The two ecoregions with a high degree of ecological representation are covered by Wood Buffalo National Park and the Thelon Wildlife Sanctuary.

The degree of ecological representation in ecoregions is lower where there are few, or no, protected areas. The most under represented ecoregions are located in the geographic center of the NWT.

Ecological representation planning involves analyzing existing or potential protected areas to assess whether, on a collective basis, they provide adequate protection to sustain ecosystem integrity within regions. The gaps identified above will be given weight when deciding on the proposal of new areas. Candidate areas could increase the ecological representation of the central portion of the NWT, if they meet the requirements of protected areas.

It is interesting to compare the percentage of each ecoregion covered by protected areas and the degree of ecological representation. When you compare the percentage of the ecoregion covered by a protected area to the degree of ecological representation achieved, it shows a large portion of an ecoregion does not necessarily need to be protected to protect the landscape features defining it. For example, if you compare the two ecoregions where ecological representation has been fully met, the percentage of the ecoregion covered by protected areas is different for both, but both achieve full ecological representation. This is why the degree of ecological representation achieved by protected areas is a better indicator than the percentage of the land base of an ecoregion that is covered by protected areas when determining how effective protected areas are at protecting biodiversity.

Hairy Braya, a species at risk found only in the NWT

Collared Pika

Map 6: Average Ecological Representation by Ecoregion Achieved by Established Protected Areas

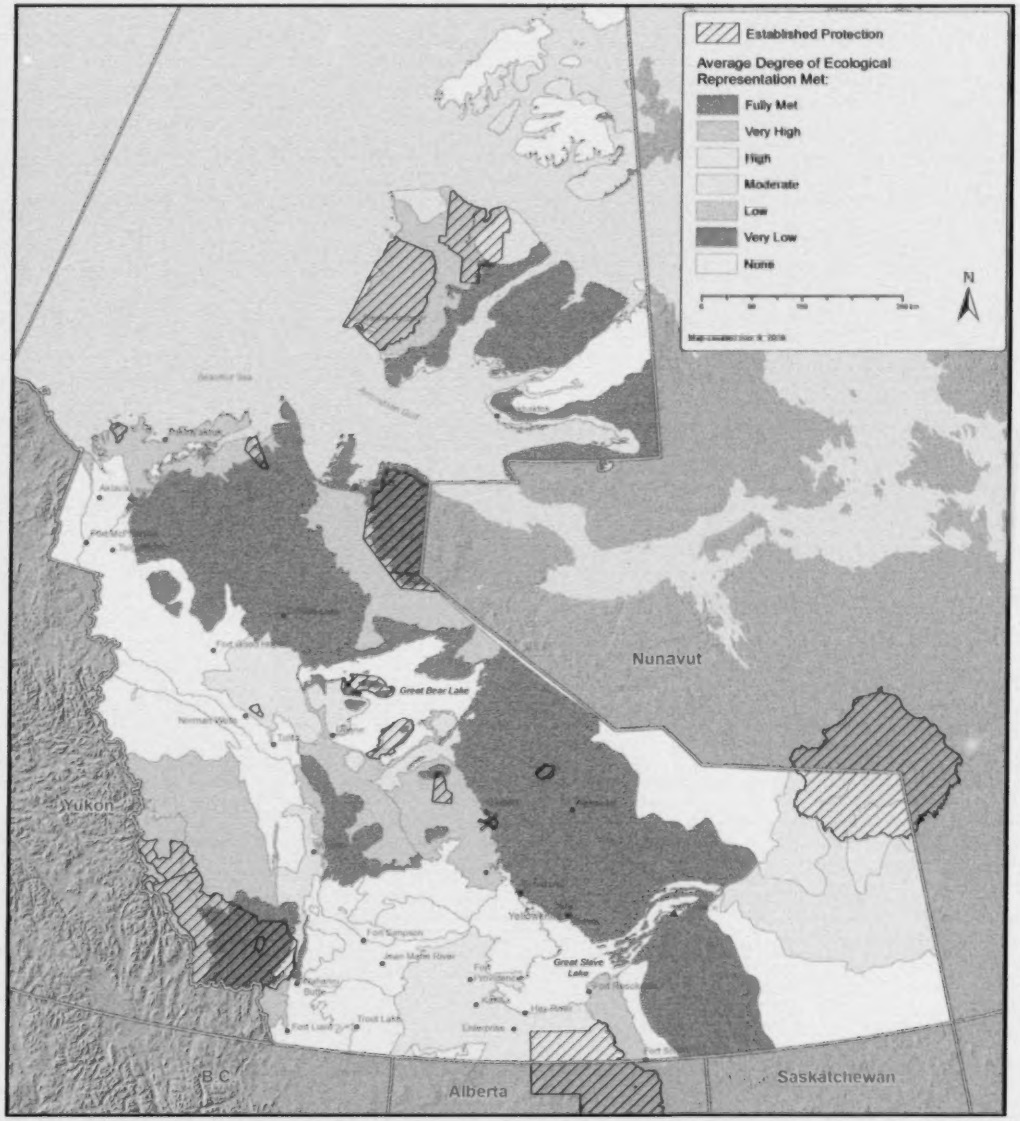
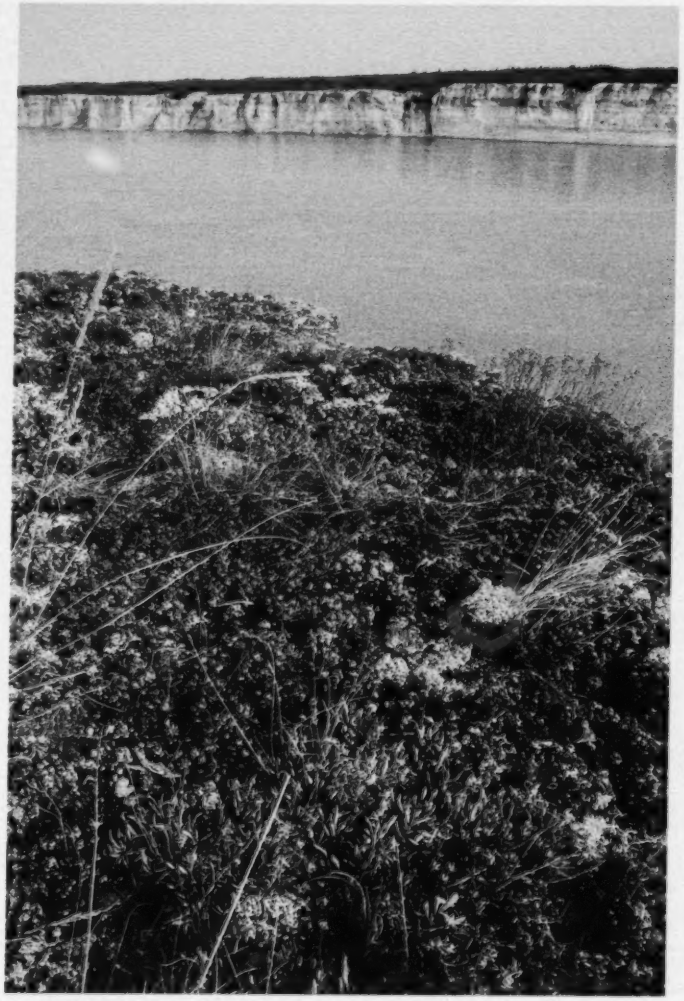


Table 3: Comparison of Percent of Ecoregion Covered by Protected Areas and Degree of Ecological Representation Achieved by Protected Areas, for Ecoregions Where at Least a Moderate Degree of Ecological Representation has been Achieved

Ecoregion Number	Ecoregion Name	Percent of NWT Land Area	Percent Covered by Protected Areas	Degree of Ecological Representation Achieved by Protected Areas	
2	Boreal Cordillera Highlands High Boreal	1.8%	76%	97%	Fully Met
3	Boreal Cordillera Highlands Mid-Boreal	1.8%	52%	88%	Very High
4	Boreal Cordillera Lowlands High Boreal	1.8%	11%	42%	Moderate
12	Taiga Shield East High Subarctic	4.9%	15%	47%	Moderate
15	Tundra Shield East Low Arctic South	2.4%	36%	72%	High
19	Tundra Plains Highlands East Low Arctic North	1.3%	94%	100%	Fully Met
24	Taiga Plains Central Highlands Low Subarctic	2.8%	8%	33%	Moderate
37	Taiga Plains South Central Mid-Boreal	4.0%	17%	65%	High
40	Northern Arctic High Arctic	2.1%	13%	42%	Moderate
41	Northern Arctic West Mid-Arctic	3.2%	62%	88%	Very High
42	Northern Arctic Low Arctic North	0.7%	9%	35%	Moderate



Alvar near the Ramparts on the Mackenzie River

2. Watersheds and Wetlands Representation

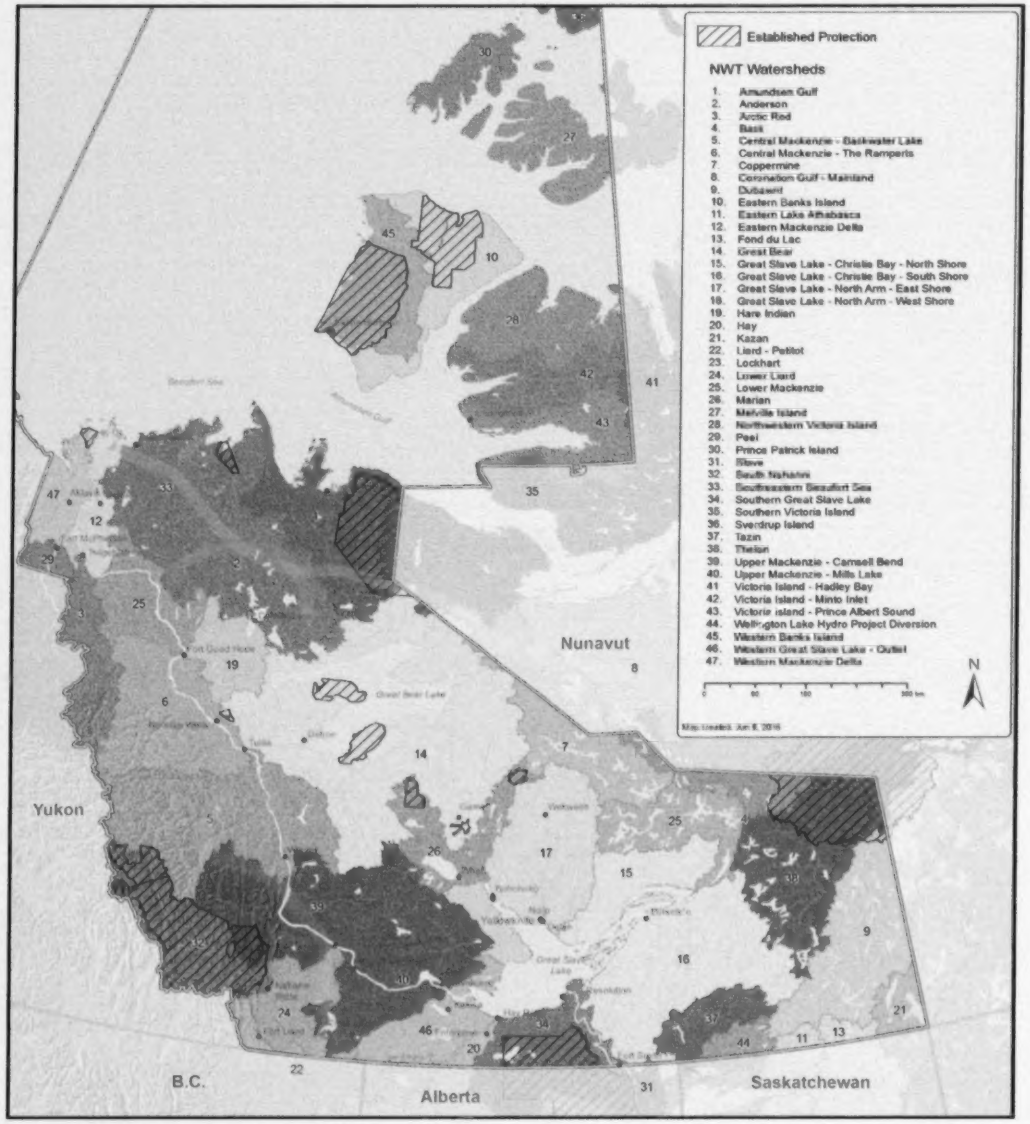
The ecological representation analysis used in this report is currently terrestrially based. While a coarse-scale freshwater classification has been completed, it still needs to be determined how it will be incorporated into the terrestrial ecological representation analysis. It is hoped future reporting will include an analysis of freshwater ecosystems.

Currently, 18 watersheds out of 47 in the NWT contain protected areas.

The South Nahanni watershed is the most protected watershed of the NWT, with 86 percent of the watershed found within the Nahanni and Nááts'ihch'oh National Park Reserves. The two watersheds on Banks Island are also well protected, with 53 percent of the Western Banks Island watershed (Egg River) and 35 percent of the Eastern Banks Island watershed (Thomsen River) protected within the Banks Island Migratory Bird Sanctuaries and Aulavik National Park.

Waterfalls near Kakisa Photo: Miki Ehrlich

Map 7: NWT Watersheds and Protected Areas in the NWT



Map 8: Percentage of NWT Watersheds Protected by Established Protected Areas

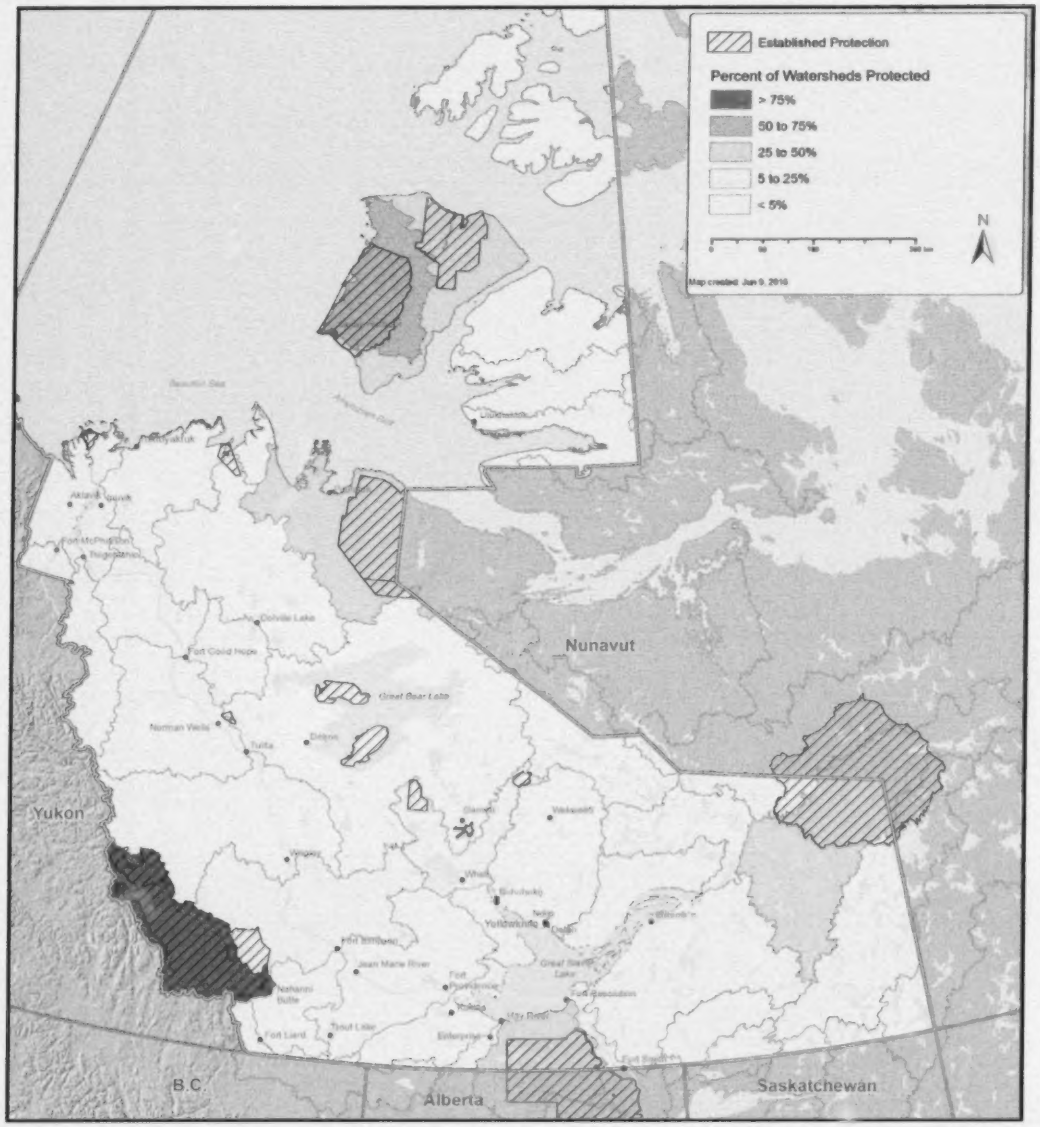


Table 4: Length of Water Courses (in km) and Size of Water Bodies (in km²) within Protected Areas

Water Courses and Water Bodies within Protected Areas	
Length of Rivers and Streams	
Within the NWT (km)	241,727
Within Protected Areas Network (km)	21,375
Within Protected Areas Network (%)	9
Size of Lakes	
Within the NWT (km²)	168,199
Within Protected Areas Network (km²)	3,088
Within Protected Areas Network (%)	2

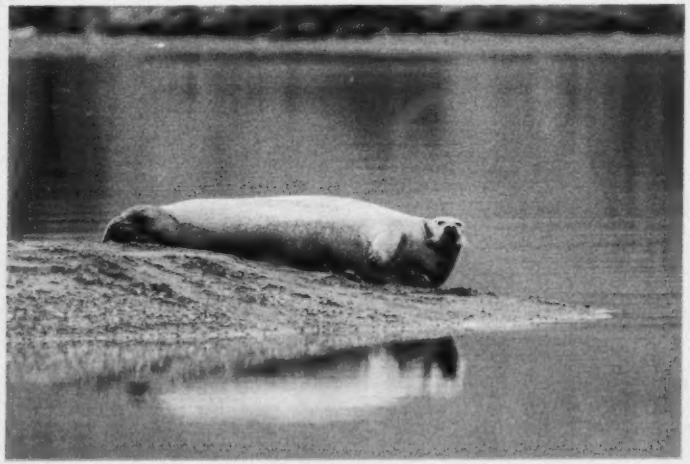
Mineral Lick in the Taiga Plains Slave Lowlands

3. Marine Representation

The Government of Canada is responsible for creating protected areas in the ocean.

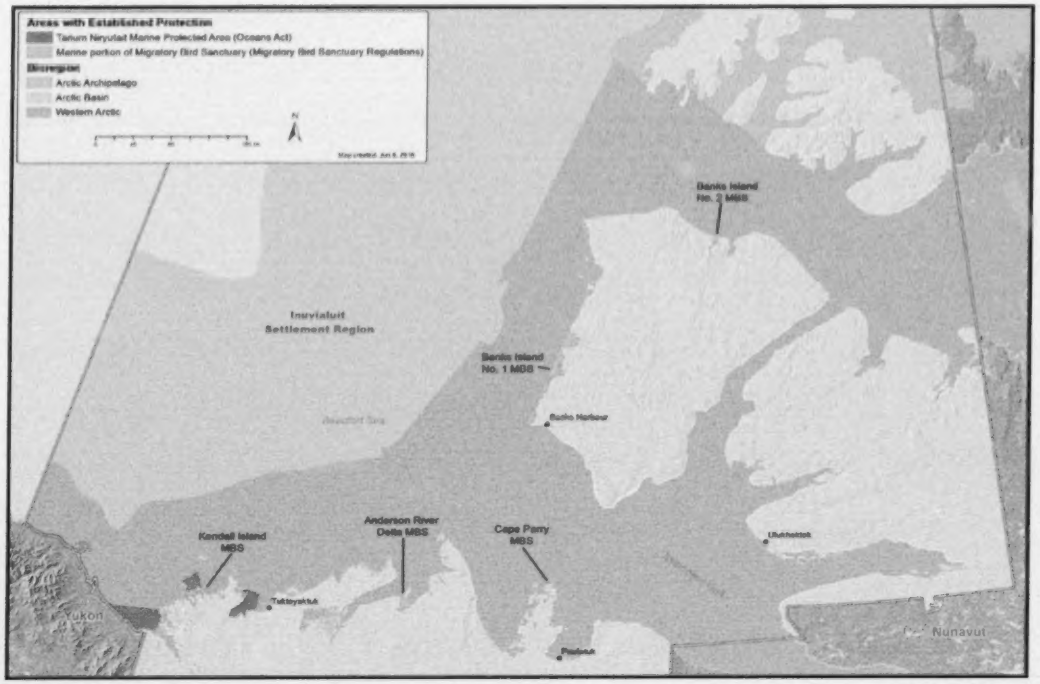
A national network of marine protected areas is proposed to include areas representative of the various ocean ecosystems of the country's three oceans. Twelve broad ocean bioregions have been defined for the purposes of planning the national network of marine protected areas.

The Beaufort Sea Large Ocean Management Area, which is the marine area off the coastline of the NWT and the marine portion of the Inuvialuit Settlement Region, includes portions of three of the 12 ecologically defined ocean bioregions. These are the Arctic Basin, the Western Arctic and the Arctic Archipelago. Currently, all marine protected areas in the NWT fall within the Western Arctic bioregion.



Bearded Seal Photo: Cameron Ekhart

Map 9: Bioregions in the NWT and Established Marine Protected Areas



4. Inclusion of Special Features

Significant ecological features may not be captured by the fairly coarse level ecological representation analysis and must be looked at individually. These are special features in the NWT.

Special features information is often incomplete, especially over a large area such as the NWT.

Often the best, and sometimes only, information available is traditional knowledge. Traditional knowledge is vital in understanding special features. For poorly known or seldom visited areas, there may not be any special features information. This, however, does not mean no special features exist in these areas.

Special features are important for a variety of reasons.

Glacial refugia are areas that remained ice-free during the last ice age. Some plants and animals survived the ice age in these refugias and now they frequently represent unique landforms and biodiversity hotspots. Plants and animals found here have, through long isolation, become genetically divergent from the rest of their species or are the last remaining examples of species that were wide-ranging before the ice age.

Deltas are low-lying areas at the mouth of rivers. They are important to human activities, fish and other wildlife because they normally have a lot of nutrients and support a larger amount of biodiversity than surrounding areas.

Eskers are ridges of sand and gravel formed by glaciers. They are frequently many kilometers long, significantly elevated and, often, drier than the surrounding landscape. Eskers provide habitat for plants and wildlife, such as wolves, lichen and caribou, and form travel corridors for many species.

Karst is a type of landform dominated by sinkholes, springs and underground rivers. Karst features are formed when water dissolves bedrock formations made of limestone, marble or dolomite. Karst landscape features provide habitat for species needing caves for at least part of their life cycle.

Mineral licks are used by many different wildlife species, including moose, caribou and mountain goats. These animals visit exposed deposits of salts or other minerals to get the nutrients not available in their usual food.

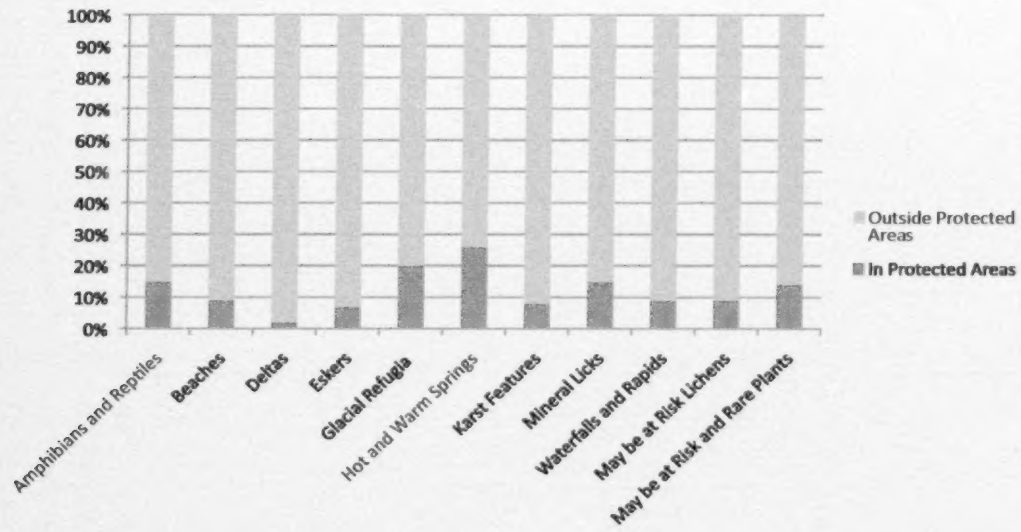
Waterfalls and rapids are fast-flowing, often turbulent, sections of a body of water flowing over a gradient or vertical drop. They oxygenate the water and are often bordered by rocky ledges or outcrops constantly sprayed with river mist. The high level of oxygen makes rapids important habitat for a number of aquatic species. Also, due to constant fast flowing water, these areas may stay open throughout the winter and provide habitat and supply drinking water to mammals and over-wintering birds.

Pinnacle Karst

Hot and warm springs, also called thermal springs, are areas where groundwater is discharged at higher temperatures than the surrounding region. Thermal springs often support different species than adjacent areas, because they are adapted to the heat and unique chemistry.

Amphibians, reptiles and plants – Some specific species information, generally amphibian and reptile sightings, may be at risk lichen and may be at risk rare plants, are included in the special feature analysis because there is limited information on them. More information on specific at risk amphibians and plants can be found in the next indicator on species at risk.

Figure 1: Percentage of Known Special Features Occurrences within and Outside of Protected Areas as of 2014



Glacial Refugia in the Tundra Cordillera, Cryoplanation Terraces

Many known special features are found in current terrestrial protected areas. Special features outside protected areas are conserved in other ways. Some regional land use plans have conditions in them to ensure that special features are conserved if they fall outside protected areas. The regulatory system, environmental assessments and industry best practices also help to minimize the impact on special features outside of protected areas.

5. Protection of Species at Risk

Forty-two species in the NWT, fewer than one in 100, are at risk of disappearing. The group most at risk of extirpation are frogs and toads (amphibians). The group with the largest increase of extinction risk during the past decade are migratory birds. Most barren-ground caribou herds across the north are in decline. Species at risk of disappearing require special attention in conservation network planning.

Three species at risk, wood bison, hairy braya and Nahanni aster, are endemic to Canada and are found nowhere else in the world. Protected areas in the NWT currently contain habitat for 29 of the 3,838 species either listed or under consideration as part of the federal *Species at Risk Act* and the *Species at Risk (NWT) Act*.

Species at risk, including the northern leopard frog, peregrine falcon and polar bear, are listed as a species of special concern and portions of their habitat are contained within protected areas. Only a small percent of the habitat of boreal woodland caribou, a threatened species, is within protected areas. Habitats of other threatened species, the hairy braya and olive sided flycatcher, are not found in any protected areas.

A list of species at risk and their occurrence in protected areas is on the following pages.

Table 5: Status of Species at Risk in the NWT and Canada and Species Found within Protected Areas

Class	Species	Status in NWT		Status in Canada		Present in Protected Area**												
		Assessment	Legal List	Assessment	Legal List	Wood Buffalo	Nahanni	Aulavik	Saoyú ?ehdacho	Tuktut Nogait	Náàts'ihch'oh	Thelon	Luge dek'ale' Tue	Ezodzíłí	Banks Island No. 1	Kendall Island	Anderson River Delta	Cape Parry
Mammals	Boreal Caribou (Woodland Caribou, Boreal Population)	THR	THR	THR	THR	x	x		x				x	x				
	Bowhead Whale (Bering-Chukchi-Beaufort Population)	n/a	n/a	SC	SC													
	Collared Pika	NA	NS	SC	UC		x				x							
	Dolphin-Union Caribou (Barren-ground Caribou)	SC	UC	SC	SC													
	Grey Whale (Eastern North Pacific Population)	n/a	n/a	SC	SC													
	Grizzly Bear (Western Population)	NA	NS	SC	UC		x	x	x	x	x	x	x	x	x	x	x	x
	Little Brown Myotis	NA	NS	END	UC	x	x				x							
	Northern Mountain Caribou (Woodland Caribou Northern Mountain Population)	NA	NS	SC	SC		x				x							
	Northern Myotis	NA	NS	END	UC	x	x											
	Peary Caribou	THR	THR	END	END			x							x			
	Polar Bear	SC	SC	SC	SC			x		x					x	x	x	x
	Wolverine	NA	NS	SC	NS	x	x	x	x	x	x	x	x	x	x	x	x	x
	Wood Bison*	NA	NS	SC	THR	x	x											
Birds	Bank Swallow	n/a	n/a	THR	UC	x	x				x		x			x	x	
	Barn Swallow	n/a	n/a	THR	UC	x	x				x		x					
	Buff-breasted Sandpiper	n/a	n/a	SC	UC			x		x					x		x	x
	Canada Warbler	n/a	n/a	THR	THR													
	Common Nighthawk	n/a	n/a	THR	THR	x	x				x		x					
	Eskimo Curlew	n/a	n/a	END	END					x							x	x
	Horned Grebe (Western Population)	n/a	n/a	SC	UC	x	x		x		x		x	x		x		
	Olive-sided Flycatcher	n/a	n/a	THR	THR	x	x				x		x	x				

Birds	Peregrine Falcon (*anatum-tundrius* subspecies complex)	NA	NS	SC	SC	x	x	x	x	x		x	x	x	x	x	x	x
	Red Knot (*islandica* subspecies)	n/a	n/a	SC	SC													
	Red Knot (*rufa* subspecies)	n/a	n/a	END	END			x							x			
	Rusty Blackbird	NA	NS	SC	SC	x	x		x	x	x		x	x		x	x	
	Short-eared Owl	NA	NS	SC	SC	x	x	x	x	x	x	x	x	x	x	x	x	x
	Whooping Crane	n/a	n/a	END	END	x												
	Yellow Rail	n/a	n/a	SC	SC	x	x											
Fishes	Bull Trout (Western Arctic Population)	n/a	n/a	SC	UC	x					x		x					
	Dolly Varden (Western Arctic Population)	n/a	n/a	SC	UC											x		
	Northern Wolffish	n/a	n/a	THR	THR													
	Shortjaw Cisco	n/a	n/a	THR	NS	x			?									
Amphibians	Northern Leopard Frog (Western Boreal/Prairie Population)	THR	UC	SC	SC	x												
	Western Toad	NA	NS	SC	SC		?											
Plants	Hairy Braya*	THR	THR	END	UC													
	Nahanni Aster*	NA	NS	SC	UC		x											
Insects	Gypsy Cuckoo Bumble Bee	NA	NS	END	UC	x	x		x		x		x	x				
	Western Bumble Bee	NA	NS	SC	UC		x				x							

Northern Leopard Frog, a species at risk Photo: Kris Kendell

n/a – Not Applicable NA – Not Assessed NS – No Status UC – Under Consideration
SC – Special Concern THR – Threatened END – Endangered

* Canadian endemic species
** Data for Wehexlaxodiale not available at time of publication.

6. Cultural Heritage Representation

In the NWT, the land is a lifeline to the culture of Aboriginal peoples. Land cannot be separated from culture.

Culturally significant areas of the NWT include areas where traditional and contemporary Aboriginal land uses have taken and continue to take place or are maintained. These areas represent the interconnectedness of people, culture and place over time, and link western and indigenous concepts of culture and nature into a more holistic world view. The conservation network that sustains ecosystems with a variety of important species and their habitats also protect NWT cultural and heritage values.

While the conservation of cultural areas is considered in the broader definition of land during conservation network planning efforts, this first Report only analyzes data on known archaeological sites.

The human history of the NWT can be classified into major themes based upon a specific era of human occupation. The cultural heritage of the NWT is divided in five broad categories, based on archaeological sites where artifacts have been found. These categories are:

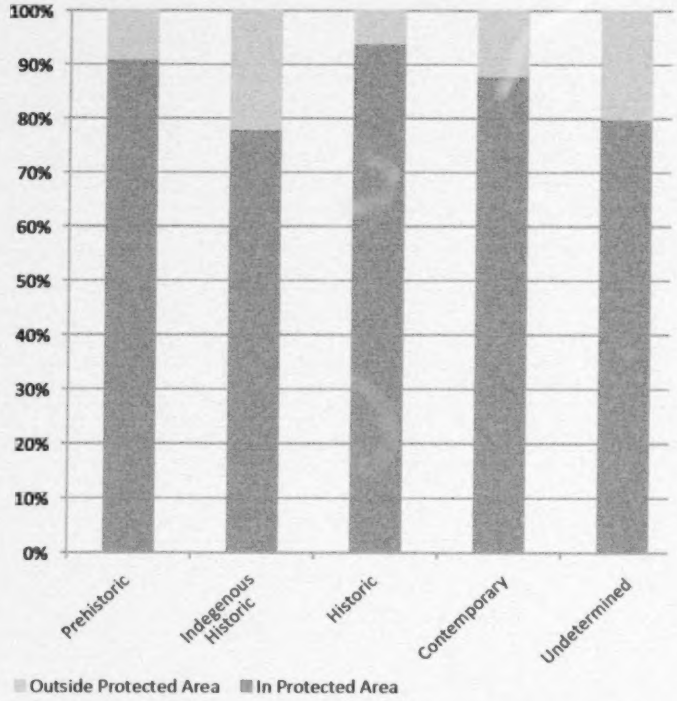
- **Prehistoric sites** represent some of the earliest North American cultures and predate the initial contact with Europeans in the NWT in about 1780.
- **Indigenous Historic Sites** are sites created by indigenous people post-contact.
- **Historic Sites** refer to non-indigenous post-contact archaeological sites.
- **Contemporary archaeological sites** are sites which may still be used by northerners, such as campgrounds or prime hunting locations.
- **Unknown, Mixed or Other sites** are those archaeological sites which do not fit well within one category or those with undetermined origins.

The percentage of each known site from one of these categories found within protected areas indicates how well protected areas are protecting elements of each category.

All archaeological sites in the NWT are protected through legislation by the *Archaeological Sites Act*. Currently, there are 6,565 known archaeological sites in the NWT.

Archaeological sites, are protected by legislation, yet do not encompass all 'culturally important sites'. Cultural heritage sites may be prehistoric or may be cultural landscapes currently in use. A Cultural landscape consists of sacred areas, trails, harvesting areas, places holding stories and traditional knowledge significant to the identity and well-being of the indigenous people of the NWT. Several culturally significant areas have been identified through the conservation network planning processes. Future reporting will focus on ensuring unidentified cultural landscapes and archaeological resources are factored into the analysis of the conservation network.

Figure 2: Percentage of Known Archaeological Sites within and Outside of Protected Areas in 2014



Old Cabin at the Smith Arm of Great Bear Lake Photo: Craig Scott

Table 6: Number of Known Archaeological Sites within Protected Areas as of 2014

Number of Known Archaeological Sites within Protected Areas						
Protected Area*	**Category**					**Total Number of Sites**
	Prehistoric	**Indigenous Historic**	**Historic**	**Contemporary**	**Unknown, Mixed or Other**	
Anderson River Delta Migratory Bird Sanctuary	8	8	-	-	5	21
Aulavik National Park	74	237	-	1	23	335
Banks Island Migratory Bird Sanctuary No. 1	4	-	1	-	1	6
Banks Island Migratory Bird Sanctuary No. 2	-	1	-	-	1	2
Kendall Island Migratory Bird Sanctuary	3	1	-	-	-	4
Nááts'ihch'oh National Park Reserve	-	3	-	6	-	9
Nahanni National Park Reserve	15	8	12	37	26	98
Saoyú ʔehdacho	37	22	4	-	1	64
Thelon Wildlife Sanctuary	71	1	-	-	8	80
Tuktut Nogait National Park	146	71	-	5	125	347
Water portion of Husky Lakes	5	-	-	-	-	5
Wood Buffalo National Park	-	-	-	-	7	7
Grand Total						**978**

* Data for Ezǫdzìtì, Luge dek'ale' Tue (Kelly Lake) and Wehexlaxodıale not available at time of publication.

Ka'agee Tu Candidate Area Photo: Pat Kane

Ejié Túé Ndáde Candidate Area Photo: Victoria St. Jean

7. Connectivity

Biodiversity and cultural resources are better conserved when areas are not isolated islands, but are nodes in the conservation network. Many NWT species have large home ranges, which may extend beyond the conservation network, and water and fire know no borders. Connectivity of protected areas must be maintained so species can continue to move freely and populations do not become isolated. Without this connectivity, protected areas can become isolated islands where plants and animals are vulnerable to extinction.

Human activities create boundaries, fragment ecosystems and impact connectivity between protected areas. Development changes the environment and habitat of a particular area and creates new corridors that influence human and animal movement patterns. It can also significantly change or remove habitat.

In the NWT, seismic lines are one of the largest landscape disturbances caused by humans. The average road density in the NWT, including all-season roads, is very low. The highest density of roads is in the southern NWT, which contains the most communities.

Commercial timber harvesting has occurred in many places in the NWT, but usually in localized areas and in small volumes.

The overall density of human activities varies across the NWT. Most of the NWT has low fragmentation. There are a few places of higher densities in the Mackenzie Delta, the central Sahtù region and southern Dehcho region. More information on fragmentation densities calculated for the NWT is available in the *NWT State of Environment Report* found online at enr.gov.ca.

Most human activities are limited or managed within protected areas. As a result, fragmentation within protected areas is much lower than outside protected areas. Human activities around or near protected areas can have an impact on connectivity. In southern jurisdictions, connectivity is commonly attempted by creating corridors between protected areas. Since most of the NWT is still largely unfragmented, conservation network planning instead looks at how the lands surrounding protected areas are managed to assess connectivity.

The NWT Cumulative Impacts Monitoring Program (NWT CIMP), in cooperation with the NWT Centre for Geomatics, is collating existing information on landscape change through human and natural disturbances. Once this information is complete, it will be used to create a more specific indicator to measure connectivity. Future reporting will also include more measures integrating protected areas into the broader conservation network.

8. Consultation and Engagement

Planning for and management of the conservation network in the NWT is a shared responsibility with governments, Aboriginal governments, organizations and communities, environmental organizations and industry. Partnerships with, and engagement of, Aboriginal people ensures a high level of local participation. Collaboration with local and traditional knowledge holders, researchers and scientists is a crucial advantage for planning and management of areas, from the first consideration of an area for protection to its long-term management and monitoring.

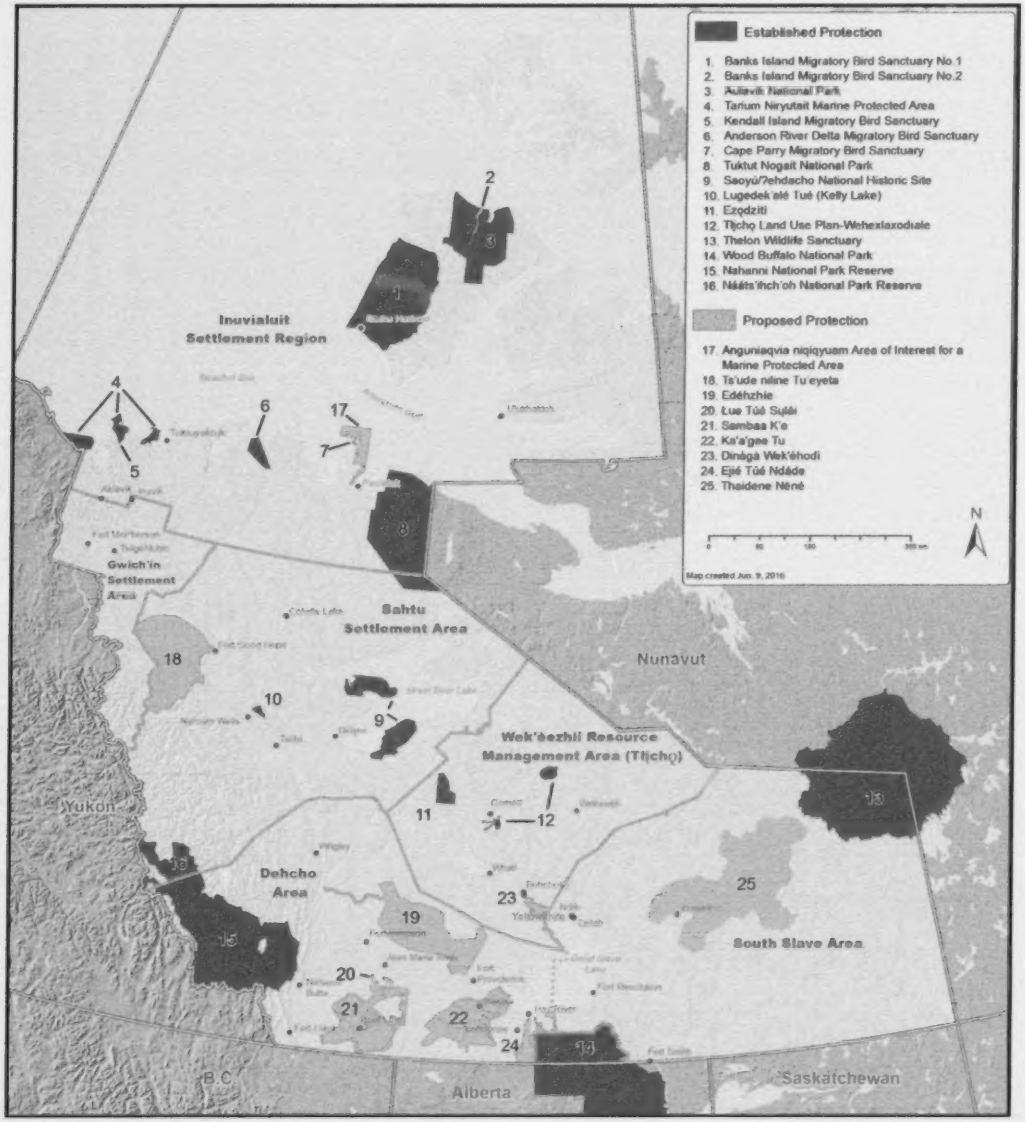
Table 7: Average Annual Types and Frequency of Consultation and Engagement Related to Conservation Planning and Establishment Activity in the NWT under the NWT Protected Areas Strategy

Annual Consultation and Engagement over a Ten-year Period	Average Amount per Year
Public Engagement Activities	25
Meetings with Communities, Aboriginal Governments and Other Stakeholders	12
Communities Visited	7
Publications Distributed	2
Communication Products in Print, Video and Digital Media	12
Groups Represented in Meetings	22
Total	**80**

Extensive consultation is done with Aboriginal governments and groups to ensure settled land claim, self-government and resources agreements, Aboriginal and treaty rights, and concerns of local communities are incorporated when selecting areas for conservation and in the management of those areas. For existing terrestrial protected areas in the NWT, all areas have a formal means of shared management, with the exception of Wood Buffalo National Park.

Many NWT communities have initiated proposals for candidate areas by consulting residents who continue to use their traditional territory. The planning and establishment of protected areas aim to preserve ecological values (biodiversity) and cultural heritage values. Conservation network planning exercises also takes into account existing economic concerns in a balanced approach to management.

Map 10: NWT Established Protected Areas and Proposed Protection



Progress is ongoing to finalize proposed terrestrial protected areas throughout the NWT: seven candidate protected areas identified through the NWT Protected Areas Strategy and Thaidene Nëné area of interest. In addition, a process is underway to establish another marine protected area in the coastal waters of the Beaufort Sea off the NWT, the Anguniaqvia Niqiqyuam Area of Interest.

Edéhzhie Candidate Area

Łue Túé Sųlái Candidate Area

9. Management Planning

Management planning is a key component in sustainable management of protected areas. Management plans provide a clear public statement of the vision, goals and objectives for a protected area approved by the government or organization responsible for its operation and administration.

Rigorous management planning is essential in monitoring the dynamics of ecosystem processes and changes in biodiversity within protected areas. This is especially important given the impacts of climate change, which are predicted to influence the north more than other areas of Canada.

Management plans are in place for the majority of protected areas in the NWT, while some of the more recent ones are in development.

Future reporting will measure progress on meeting objectives of management plans and stewardship activities on an individual protected area basis and within the conservation network. Management plans for the protected areas in the NWT should be coordinated for monitoring and management of factors related to biodiversity, so overall trends can be determined and NWT-wide management measures can be applied, as needed.

Sambaa K'e Candidate Area Photo: Ducks Unlimited Canada, Jason Charlwood

Table 9: Status of Management Plans for NWT Protected Areas

Protected Area	Type of Protected Area	Date of Management Plan
Anderson River Delta	Migratory Bird Sanctuary	1992
Banks Island No. 1	Migratory Bird Sanctuary	1992
Banks Island No. 2	Migratory Bird Sanctuary	1992
Cape Parry	Migratory Bird Sanctuary	1992
Kendall Island	Migratory Bird Sanctuary	1992
Aulavik	National Park	2012
Tuktut Nogait	National Park	2007
Wood Buffalo	National Park	2010
Nááts'ihch'oh	National Park Reserve	none
Nahanni	National Park Reserve	2010
Saoyú ʔehdacho	National Historic Site	in development
Luge Dek'ale' Tue (Kelly Lake)	Protected through Sahtù Dene and Métis Land Claim Agreement and Sahtù Land Use Plan	none
Ezǫdzìtì	Protected through Tłı̨chǫ Final Agreement	none
Thelon	Wildlife Sanctuary	2011
Wehexlaxodıale (Land Use Exclusion Zone)	Tłı̨chǫ Land Use Plan	none

Fireweed Growing on an Esker

Benefits and Opportunities of the Conservation Network in the NWT

Sah Naji Kwe Lodge near Dinagà Wek'èhodì Candidate Area

Conservation network planning efforts in the NWT provide additional benefits and opportunities. These include complementing economic development initiatives, providing ecosystem services, human health, food security, and public education and outreach.

Rosa Mantla Preparing Caribou Hide at Tundra Science and Culture Camp

A Conservation Economy, part of a Diversified Economy

Defining the extent of protected areas in the NWT provides clarity and certainty for developers and industry.

Non-renewable resource research, including additional field research collection, is a component of the assessment of values for all proposed areas. This ensures protected areas boundaries take into consideration economic values and, where possible, avoid areas found to have high economic potential.

Protected areas are important to a diversified NWT economy and Canada. Economic impact analysis often outlines the 'ripple effect' visitor and government spending creates within the regional economy. The size of the economic 'ripple' is measured through gross domestic product (GDP), labour income, employment and tax revenue.

Table 10: Visitation to National Parks in the NWT by Fiscal Year

Visitation to National Parks in the NWT by Fiscal Year					
National Park	**2008-2009**	**2009-2010**	**2010-2011**	**2011-2012**	**2012-2013**
Aulavik	26	18[B]	12[A]	16	8[C]
Nahanni	810	810[A]	775	1,033	840
Tuktut Nogait	6	4[B]	2[A]	7	7
Wood Buffalo	975[A]	2,479[B]	1,599	1,324	1,790

[A] Total contains three or more months of estimated data.
[B] Recording methodology change.
[C] The only licensed commercial operator ceased operations in 2012, contributing to the decrease in visitation.

Conservation of land and water continues to be important as several economic sectors and many livelihoods in the NWT depend on a healthy land. In 2009, the GNWT calculated the traditional economy and harvesting for local foods contributed more than $9 million in food value to the territory with 40 percent of NWT residents over the age of 15 spending some time trapping, fishing or hunting.

As of 2013, NWT protected areas had capital assets exceeding $100 million, not including the value of the land itself. The GNWT Aboriginal Tourism Engagement Strategy states tourism generates hundreds of jobs and dozens of business opportunities in the NWT. A 2012 Canadian Nature Survey on NWT residents' connection to nature indicated 13 percent derived most of their income from a nature-related profession. Two percent reported either 'wildlife management' or 'environmental consultation' as primary sources of income. In addition, 67 percent of residents chose where they live partly because of the access to nature.

Protected areas also contribute to the NWT economy by providing jobs, revenue and business opportunities for local people and local suppliers. The majority of the visitations to NWT protected areas are to national parks. National parks visitor spending in 2009 contributed $16.4 million directly to the NWT economy, while both private and public employment in NWT national parks contributed 183.7 full-time jobs.

Bobby Drygeese Camp, Aboriginal Cultural Tours near Dettah Photo: Tessa Macintosh

An economic impact analysis completed for Parks Canada, using data collected in 2008-2009, found the amount of money spent by visitors to national parks in the NWT, coupled with Parks Canada's own spending (capital expenditures, operating expenditures and salaries/wages), has a significant impact on the NWT and Canada's economy. In 2008-2009, Canadian visitors spent $5 million and international visitors spent $2.6 million, a total of $7.6 million in visitor spending. GDP, as a result of spending by Canadian visitors to NWT national parks, was $1.9 million, with international visitor spending contributing $1 million to the GDP. Same-day expenditures by visitors to national parks in the NWT amounted to $1.85 million, while overnight visitor expenditures were $5.79 million.

The economic investments from national parks in the NWT have an impact other than visitors. Federal government spending on national parks in the NWT contributed $13.5 million to the GDP. Considering direct, indirect and induced impacts of spending for 2008-2009, a total $24.6 million was contributed to the GDP of Canada from national parks in the NWT. Of this, $16.4 million, or nearly two-thirds, directly contributed to the economy of the NWT.

The local NWT tourism industry has continued to increase in revenues every year for the past five years. The tourism industry generated $132.5 million in visitor spending in 2014, which is a 24 percent increase from the previous year. The outdoor tourism sector contributed $42 million to the territorial economy. This includes aurora borealis viewing, hunting, fishing and wilderness experience tourism.

The 2015-2020 GNWT Tourism Marketing Strategy focuses on investing in the growing cultural tourism market as the general and business traveller sector grows. The outdoor recreation market is promoted as a high-end experience, with operators in parks, campgrounds and isolated areas offering exciting recreational experiences. The outdoor recreation tourism sector is expected to increase visitation and revenue as candidate areas are established and the conservation network is promoted.

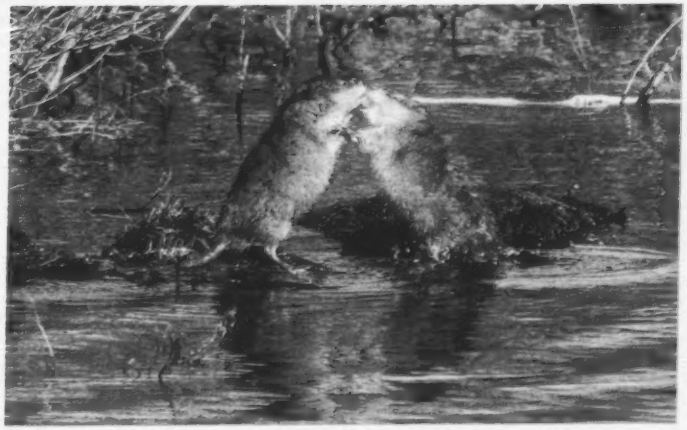
Campfire under the Aurora Photo: Tessa Macintosh

Ecosystem Services

Ecosystem services are a wide range of benefits resulting from healthy ecosystems. These include clean air, water purification, building materials and pollination of crops. No comprehensive study, specifically targeting the ecosystem service value of protected areas, has been conducted in the NWT. The Canadian Boreal Initiative assessed the 'natural capital value' of the Mackenzie River basin in 2010, which provided a glimpse into the real wealth of the natural environment of the NWT. This study can be used to determine the potential value of ecosystem services provided by healthy natural ecosystems within protected areas.

The potential ecosystem services product (ESP) value, equivalent to gross domestic product (GDP) for market-based natural capital development, for the Mackenzie River watershed has been estimated at $570.6 billion per year or $3,426 per hectare per year. 'Potential' means it is the revenue from ecosystem services that the watershed is capable of producing while in a natural state. The greatest ESP values are estimated for water bodies ($188.6 billion), wetlands and peatlands ($181.7 billion) and tundra permafrost ($113 billion). These ecosystems had the highest values because of their value in climate regulation. They store carbon annually and over the long term. They also regulate and supply water.

As more information on ecosystem services in the NWT becomes available, it will be incorporated into future reporting.



Muskrat

Great Bear Lake, Déline Photo: Tessa Macintosh

Human Health

Research studies indicate protected areas provide important benefits to human health at both the individual and the community level. Benefits associated with time spent in nature provided by protected areas include faster recovery times from surgery and stress, greater psychological well-being, increased physical and spiritual health, higher levels of physical activity and child development as well as stimulation of a greater sense of purpose. Findings have also shown the psychological benefits of natural areas increase with an increase in biodiversity.

It will be important to partner with social and health professionals to conduct further research and build on opportunities for health-related activities within protected areas and the broader conservation network.

In future, a coordinated approach to health research could help health authorities to more systematically harness the health potential of protected areas and the broader conservation network. At the same time, conservation network planning would be able to better integrate human health and well-being objectives into their management planning.

Food Security – Indigenous People's Traditional Food Systems

The conservation network can provide an opportunity to address indigenous traditional food security issues in the NWT, also known as country food security. A growing momentum for securing local sustainable food sources worldwide, as a way to mitigate climate change, calls for reduction in reliance on fossil fuels to transport food from long distances, while strengthening local food networks and production.

In addition, often the most biologically diverse areas are also the most culturally rich and viable areas for local indigenous people's traditional food systems. Protected areas with objectives to preserve and protect culture could consider conservation strategies focusing specifically on conserving of traditional indigenous practices such as food preparation, harvesting and food sharing protocols. This can strengthen links between healthy lands and healthy people.

The continued access to healthy land, and its biodiversity, will ensure the continued access to ecosystem services and indigenous traditional food security. Through careful, collaborative conservation network planning, the conservation network could support and strengthen traditional economies, indigenous people's traditional food systems and community resiliency in the face of climate change. The conservation network has the potential to make a valuable contribution to the physiological and social well-being of NWT residents.

In addition, health research demonstrates links between a traditional diet and the prevention of degenerative diseases as well as social and mental well-being.

Smoking Fish in Thaidene Nëné Candidate Area Photo: Pat Kane

Public Education and Outreach

The NWT conservation network could help to fill current gaps in information on the status of the NWT's ecosystems health and significance of cultural landscapes by providing a venue for interpretation of these values and their status. Interpretation is an effective means of instilling stewardship of the environment and sharing information on what the ecological and cultural values of an area are, while, at the same time, providing updates to the public on what is being done and how they can contribute to the protection of those values.

Bird Viewing at the Tundra Science and Culture Camp

The conservation network provides an ideal and consistent place to present environmental education to the general public and visitors. There are several ways to facilitate interpretation, including using personal and non-personal media. Personal interpretation can be delivered by staff or researchers who may be working on visitor experiences, educational programming, research, monitoring or enforcement within a protected area. Non-personal interpretation can also be used to deliver information through various means, such as the use of interpretive panels at key locations, videos, art projects, websites, social media, school curriculum materials, outreach programs and publications. Different media can be used to reach a variety of audiences and provide the best available information on: an area's ecological and cultural significance, species at risk, biodiversity, management; protocols of area use, stressors or threats to the area, on-going monitoring, related human health issues; and other environmental education priorities as required.

Next Steps

Lady Evelyn Falls, Tuktut Nogait National Park

Springs in the Taiga Plains

Future reporting will begin to incorporate the broader conservation network and track its important contribution to the conservation of biodiversity. Future reporting will also incorporate new information, improve the current indicators used and define new indicators as needed to measure the health of the conservation network in the NWT. Management and monitoring, including the vigilant tracking of climate change effects and consideration of wildland fire regime, will improve the reporting in the next report.

Work is ongoing to include freshwater analysis into the degree of ecological representation indicator.

Existing information on landscape change through human and natural disturbances is being collated by the NWT CIMP and the NWT Centre for Geomatics. This will help improve the indicator on connectivity.

Other factors, which could have an impact on biodiversity and ecosystems within protected areas and the broader conservation network, could include air quality, water quality and quantity, and invasive species.

Your input is important. Your suggestions on additional indicators and your insights on the protected areas in the NWT are appreciated. Contact us at ConservationPlanning@gov.nt.ca.

Saoyú-ʔehdacho National Historic Site Photo: Tom Nesbitt

Find More Information

Ka'a'gee Tu Candidate Area, Tathlina Lake. Photo: Pat Kane

Delta Tital Flats in the Beaufort Sea with Snowgeese

Conservation network planning in the NWT, enr.gov.nt.ca/programs/conservation-planning.

NWT Protected Areas Strategy, nwtpas.ca.

National Parks in the NWT, Parks Canada at pc.gc.ca.

Migratory Birds Sanctuaries in the NWT, Environment Canada at ec.gc.ca/ap-pa/.

Marine protected areas in the NWT, Beaufort Sea Partnership at beaufortseapartnership.ca/integrated-ocean-management/.

Canadian Council on Ecological Areas at ccea.org/.

Specific Sources and Notes

Introduction

Canada is a party to the Convention on Biological Diversity, which is an international agreement developed through the work of the United Nations. Under the Convention, the Strategic Plan for Biodiversity for the years 2011-2020 was agreed to by member nations.

The *2020 Biodiversity Goals and Targets for Canada* were announced in February 2015 by the Government of Canada. The goals and targets for Canada stem from the targets set by the international Convention on Biological Diversity.

Protected Areas in the NWT

While there are two bird sanctuaries on Banks Island, Banks Island Migratory Bird Sanctuary No. 2 is not included in the statistics because it completely overlaps with Aulavik National Park.

Area calculations (sizes in tables) are based on spatial data in Albers Equal Area projection, Central Meridian at 119, Reference Latitude at 0, Standard Parallels at 62N and 70N. Area sizes have been rounded for summary purposes; they are not accurate to legal, surveying or engineering standards. Different agencies may use data in different map projections for calculating sizes of areas, resulting in the sizes of the same protected areas not always matching exactly.

Climate Change and Conservation Network Planning

The Intergovernmental Panel on Climate Change looked at changes in extreme temperatures and precipitation events. *Changes in temperature and precipitation extremes in the IPCC ensemble of global coupled model simulations* published in the Journal of Climate in 2007.

The impacts of a 1999 storm surge on the Mackenzie Delta were examined and found to have changed ecosystems along the outer edge of the delta in a way that had not happened in the past 1,000 years. The study is published in the 2011 Proceedings of the National Academy of Sciences as *Impacts of a recent storm surge on an Arctic delta ecosystem examined in the context of the last millennium.*

Canadian researchers have spoken to the importance of protected areas in an era of rapid climate change in a paper written by Christopher J. Lemieux, Thomas J. Beechey, and Paul A. Gray, *Prospects for Canada's protected areas in an era of rapid climate change* and published in 2011 in the journal Land Use Policy.

Marine Representation

Shapefiles for the marine bioregions were provided by the Department of Fisheries and Oceans and are part of the National Framework for Canada's Network of Marine Protected Areas (2011).

Protection of Species at Risk

Information was taken from *NWT Species 2011-2015, General Status Ranks of Wild Species in the Northwest Territories*, published by Environment and Natural Resources, Government on the Northwest Territories. It can be found online at nwtspeciesatrisk.ca.

Cultural Heritage Representation

The Prince of Wales Northern Heritage Centre's Archaeological Sites Database has information on the known archaeological sites in the NWT.

A report published in 2007 on documenting cultural landscapes in the NWT, entitled *"Living with the Landscape: A Manual for Documenting Cultural Landscapes in the NWT"*, can be found on-line at pwnhc.ca

Connectivity

An analysis, *Status of Woodland Caribou in a Changing Landscape,* was done in 2010 by Environment and Natural Resources to determine the, which included an analysis of fragmentation. This can be viewed at enr.gov.nt.ca.

A Conservation Economy, part of a Diversified Economy

An economic impact analysis, *Economic Impact of Parks Canada,* was undertaken by Outspan Group Inc. in 2011 for Parks Canada to determine the economic impact of national parks.

The Canadian Parks Council, including all federal, provincial and territorial parks agencies, published the *Economic Impact Model for Parks* (EIMP).

The GNWT tourism and traditional economy data is available online at iti.gov.nt.ca.

Ecosystem Services

The 2010 Canadian Boreal Initiative published a report, *The Real Wealth of the Mackenzie Region: Assessing the Natural Capital Values of a Northern Boreal Ecosystem,* which assessed both the market value and non-market value (i.e. value of ecosystem services) of the Mackenzie watershed.

Human Health

The content for this section was derived from several studies that were referenced in a journal publication on the health benefits of protected areas. Romagosa, F., et al. From the inside to the outside in: Exploring the role of parks and protected areas as providers of human health and wellbeing. *Journal of outdoor recreation and tourism* (2015).

Food Security – Indigenous People's Traditional Food Systems

According to the *Florence Declaration on Heritage and Landscape as Human Values (2014),* cultural heritage and landscape are fundamental for community identity and should be preserved through traditional practices and knowledge that also guarantees that biodiversity is safeguarded. A copy can be downloaded online at icomos.org.

In 2014, the Council of Canadian Academies released "*Aboriginal Food Security in Northern Canada: An Assessment of the State of Knowledge*". This is available at scienceadvice.ca.

Canada's Public Policy Forum in 2015 released the report *Toward Food Security in Canada's North* available at ppforum.ca.

Mantoo Island, near Sahyúé/Déhcho National Historic Site. Photo: Tessa Macintosh

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